Geosyntec
consultants

SPECIFICATION COVER SHEET

Client: Gowanus Canal Remedial Design Group **Project:** Gowanus Canal – 4th St Turning Basin Pilot Study – Dredging and Capping **Project #:** HPH106A

SPECIFICATION SECTION: 44 08 40 **TITLE:** DREDGE WATER TREATMENT SYSTEM REQUIREMENTS

SPECIFICATION PREPARED BY:
(Specification Preparer, SP)
Signature: Linxi Chen
Name: Linxi Chen
Date: 5/18/17

SCOPE AND FORMAT CHECKED BY:
(Scope and Format Checker, SFC)
Signature: LSW
Name: Lauren Wellborn
Date: 5/19/2017

DETAILED REQUIREMENTS CHECKED BY:
(Detailed Requirements Checker, DRC)
Signature: DNicholas
Name: Darrell Nicholas
Date: 5/19/17

APPROVED BY:
(Specification Approver, SA)
Signature: J.F. Beech
Name: J.F. Beech
Date: 18 MAY 2017

Record of Revision (Number and initial all revisions)

Rev. No.	Reason	Date	By	Checked	Approval
0	TB4 Pilot Study Design – Issued for Bid	05/19/17	LC	LSW	JFB

SECTION 44 08 40

DREDGE WATER TREATMENT SYSTEM REQUIREMENTS

This page is intentionally left blank.

Geosyntec
consultants

SPECIFICATION COVER SHEET

Client: Gowanus Canal Remedial Design Group **Project:** Gowanus Canal – 4th St Turning Basin Pilot Study – Dredging and Capping **Project #:** HPH106A

SPECIFICATION SECTION: **44 08 40** **TITLE:** **DREDGE WATER TREATMENT SYSTEM REQUIREMENTS**

SPECIFICATION PREPARED BY:
(Specification Preparer, SP)
Signature
Name Linxi Chen Date 5/18/17

SCOPE AND FORMAT CHECKED BY:
(Scope and Format Checker, SFC)
Signature
Name Lauren Wellborn Date

DETAILED REQUIREMENTS CHECKED BY:
(Detailed Requirements Checker, DRC)
Signature
Name Darrell Nicholas Date

APPROVED BY:
(Specification Approver, SA)
Signature
Name J.F. Beech Date

Record of Revision (Number and initial all revisions)

Rev. No.	Reason	Date	By	Checked	Approval
0	TB4 Pilot Study Design – Issued for Bid	05/19/17	LC	LSW	JFB

This page is intentionally left blank.

SECTION 44 08 40

DREDGE WATER TREATMENT SYSTEM REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

A. This Section describes the Contractor's responsibilities for: (i) sizing the dredge water treatment system (DWTS) based on anticipated dredging process and processing rates, storm water from secondary containment, and other washing activities; (ii) designing, furnishing, installing, operating, and maintaining water treatment equipment to treat dredge water; and (iii) discharging treated water back to the Canal through one of the two Treated Water and Stormwater Discharge Locations shown on the Construction Drawings.

1.02 RELATED SECTIONS AND PLANS

A. Section 01 33 00 Submittals

B. Section 01 35 29 Health, Safety, And Emergency Response Requirements

C. Section 01 51 00 Temporary Utilities

D. Section 01 57 19 Temporary Environmental Controls

E. Section 02 51 19 Dredged Sediment and Waste Management

F. Section 35 20 23.13 Dredging and Dewatering

G. Section 01 78 00 Project Closure

H. Construction Drawings

1.03 SUBMITTALS

A. The Contractor shall submit the following to the Owner's Representative in accordance with Section 01 33 00**:**

1. Dredge Water Treatment and Management Plan

   The Contractor shall demonstrate compliance with the requirements outlined in this Section and in related Sections and Construction Drawings. The plan shall be approved and stamped by a professional engineer (PE) licensed in the State of New York. The Contractor shall provide qualified operators meeting the requirements of

the State of New York. The Plan shall outline the construction sequence, installation details, and means and methods for installation and operation of all water treatment operations including, but not limited to:

a. A description of means and methods for the DWTS operation including treatment capacity, distribution and treatment components, and appurtenances;

b. A description of pumps, piping, and other equipment necessary for:

   i. Transferring wash water and decant water from sediment barges to the DWTS;

   ii. Transferring water between treatment processes;

   iii. Injecting treatment chemicals;

   iv. Backwashing filters and transferring treatment sludges; and

   v. Discharging treated water to Canal through one of the two Treated Water and Stormwater Discharge Locations shown on the Construction Drawings.

c. Calculations supporting the selection of component and sizing for each component. The Contractor shall determine flow paths, flow rates, pressures, and temperatures for various system operating conditions.

d. Schematic drawings of the DWTS, including:

   i. DWTS layout and instrumentation diagram including:

      - Proposed locations of treatment system components, including a pump layout, piping scheme, and instrumentation diagram;

      - Details of any pipe trenches and pipe support systems;

      - Routing of influent piping from the sediment barge to the DWTS; and

      - Routing of effluent piping from the DWTS to the Treated Water and Stormwater Discharge Locations on the Staging Site shown on the Construction Drawings.

   ii. Sizes, type, grade, or class for all tanks, pumps, piping, filters, and other equipment;

e. Manufacturer's product data for pumps, tanks, process instrumentation, flow meters, filter media, and any other devices needed for dredge water treatment;

f. Manufacturer's product data including but not limited to commercial names, function and Safety Data Sheets for water treatment chemicals, polymers and/or flocculants. A description of polymer/chemical dosage concentration, how it will be applied, and proposed usage frequency (continuous or slug dose); and

g. Procedure for determining if stormwater from the DWTS secondary containment system can be direct discharged or requires treatment before discharge.

h. A copy of DWTS operation and maintenance (O&M) manual on site, including but not limited to compliance with performance standards and maintaining operations including maintenance of adequate spare parts, startup and shutdown, and preventative maintenance.

2. Initial calibration records and weekly inspection reports of pumps, piping and tanks during operation.

3. Results of bench-scale jar testing of polymer/chemical.

4. Daily summary of continuous effluent monitoring for turbidity, flow, pH and conductivity, and daily record of any downtime of DWTS, including cause and repairs.

1.04 HEALTH AND SAFETY REQUIREMENTS

A. The Contractor shall comply with environmental health and safety/training requirements in accordance with the approved Health and Safety Plan and Section 01 35 29.

1.05 REFERENCES

A. The following codes and standards (versions as of April 2017):

1. American Water Work Association (AWWA) D103 Standard for Potable Water Storage Tanks;

2. New York City Fire Code Chapter 27 – Hazardous Materials;

3. Rules of the City of New York (RCNY) Title 15, Chapter 28: Citywide Construction Noise Mitigation;

4. New York Administrative Code Title 24, Chapter 1: Environmental Protection and Utilities – Air Pollution Control;

5. National Electric Code (NEC);

6. Hydraulic Institute, *Hydraulic Institute Standards*, 14th ed., Hydraulic Institute, Cleveland, OH;

7. AWWA Standard for Granular Filter Material, American National Standards Institute (ANSI)/AWWA B100-01;

8. AWWA B604 Standard for Granular Activated Carbon;

9. ASTM D1125-14 Standard Test Methods for Electrical Conductivity and Resistivity of Water; and

10. ASME Boiler and Pressure Vessel Code.

B. Geosyntec, 2014. Modified Elutriate Testing (MET) Results. (Provided as Attachment K.8)

PART 2 PRODUCTS

2.01 PROCESS INSTRUMENTATION AND CONTROL SYSTEM

A. The Contractor shall evaluate four levels of control methods: manual, semiautomatic, automatic, and supervisory; and select the appropriate degree of instrumentation and control based on equipment selection and manufacturer's specifications.

B. The Contractor shall provide an instrumentation and control system that, at a minimum, provides basic automation for the following items: flow rate control, chemical feed rate control, pump rate control, filter control, and analysis and continuous recording of effluent water quality for pH, turbidity, and conductivity. The Contractor shall provide automatic shutdown and alarm system for high-high level condition.

C. The Contractor shall provide measurement devices that measure the water level, pressure, flow rate, turbidity, pH, conductivity, and polymer/chemical dosages as follows:

1. Flow meters shall be provided to measure flow rate.

2. Turbidity meters shall be provided. Nephelometric turbidimeters shall be selected. An air bubble trap shall be installed in the sample line upstream of the turbidity meter to prevent false high reading of water that contains air bubbles.

3. pH meters shall be composed of three electrodes that are chemically resistant: a pH sensing electrode, a reference electrode, and an electrode that compensates for the temperature. These electrodes shall be mounted in a chamber and installed in the sample line or submerged in the tank. The pH meter shall have the capability for temperature compensation and have a pH range of 0 to 14.0 standard units (s.u.) with a minimum resolution of 0.1 s.u.

4. Conductivity meter. The Contractor shall provide the proper in-line conductivity meter with a minimum resolution of 5% of the measured value. The conductivity electrodes shall be composed of chemically resistant materials, and conform to ASTM D1125 Standard Test Methods for Electrical Conductivity and Resistivity of Water.

5. Automatic controllers that check the polymer/chemical dosage.

D. The Contractor shall provide the appropriate types of control modes, proportional control, cascade control, and ratio control for each application.

E. The Contractor shall maintain spare pH, turbidity, and conductivity meters onsite so that they can be immediately replaced (and discharge allowed to continue) if any of these meters require maintenance or repair.

2.02 SECONDARY CONTAINMENT

A. The Contractor shall provide secondary containment for the DWTS components which comply with the requirements of the New York City Fire Code Chapter 27 – Hazardous Materials and the requirements of 40 Code of Federal Regulations (CFR) 112.7 "General Requirements for Spill Prevention, Control, and Countermeasure Plans."

B. Secondary containment is required when a container exceeds 55 gallons or aggregate capacity of multiple containers exceeds 1,000 gallons.

C. Secondary containment for outdoor storage areas shall be designed to contain a spill from the largest container plus the volume of a 24-hour rainfall from a 25-year storm.

D. Secondary containment shall be designed to contain a spill from the largest container plus the design flow volume of fire protection water for a minimum period of 20 minutes.

2.03 PUMPS

A. All pumps used in the DWTS shall conform to the applicable ANSI or ASTM standards.

B. The Contractor shall provide transfer pumps that transfer wash water, decant water, and stormwater from sediment barges, decontamination pads (if applicable), and the asphalt pad to the DWTS. The transfer pumps shall be capable of handling solids remaining after sediment has decanted.

C. The Contractor shall provide suitable types of noncorrosive pumps, such as peristaltic pumps or equivalent, for liquid chemical metering and injecting of treatment chemicals.

D. The Contractor shall provide proper types of pumps suitable for transferring water between treatment processes, per manufacturer's recommendations.

E. The Contractor shall provide proper types, diaphragm, peristaltic, or gear pumps, for polymer/chemical feed pumps. The chemical feed pumps shall be noncorrosive and compatible with the chemicals.

F. The Contractor shall provide proper types of pumps for backwashing filters and transferring treatment sludges.

G. The Contractor shall provide proper types of pumps for transferring treated water to the Canal.

H. The Contractor shall provide sludge return pumps to transfer solids back to the barge for transportation and disposal.

I. The Contractor shall provide proper pumps for transferring oil from the oil/water separator to non-aqueous phase liquid (NAPL) storage tank. The pumps for this application shall be capable of handling oily materials.

J. The capacity of the pumps shall be such that, with any one pump out of service, the remaining pumps shall have the capacity to handle peak daily flow of the dredging operation. Or a replacement pump shall be maintained on site.

2.04 PIPING

A. Pipe sizes, joints, and wall thicknesses (or thickness schedule) shall be provided.

B. The Contractor shall provide piping systems with strength that can resist internal pressure, handling, the pipe characteristics must enable the pipe to withstand corrosion, abrasion, expansion, and contraction of the pipeline.

C. The piping materials shall be such that they are compatible with the fluid or sludge they are transferring, and conform to applicable industry standards. The sludge piping shall be provided to have the appropriate diameter and velocity to prevent clogging.

D. The thickness design, pipe trench dimensions and details concerning pipe support, bedding, compact fill around the pipes, and backfill of piping shall conform to the latest industry standards applicable to the pipe material selected and manufacturers' specifications.

E. The Contractor shall provide pipe-related products per manufacturer's recommendations, including but not limited to the following items: fittings, couplings, manifolds, flexible and rigid tubing, riser tubing, dip tubes, hoses, and drop pipes.

2.05 VALVES

A. Valves shall be used only where they are essential. The Contractor shall select appropriate types of valves for each application which can resist corrosion, abrasion, and pressure, and conform to manufacturer's specifications and applicable ANSI/AWWA standards.

B. The Contractor shall provide suitably sized control valves that are capable of handling the full range of anticipated flows.

C. The Contractor shall install suitable shutoff and/or check valves at the suction and discharge lines of each pump. All shutoff and check valves shall be operable from ground level and accessible for maintenance.

D. The system controls valve shall control all functions of the filter's back flushing, rinsing, and service cycles.

2.06 TANKS

A. The Contractor shall provide tanks that have appropriate working capacities.

B. The tanks may be new or used, but shall be certified clean, serviceable and adequate for the intended purpose. The Owner's Representative reserves the right to inspect and approve/reject the use of the tank. If the Owner's Representative determines that an alternate tank is required, the cost to demobilize the dirty tank and mobilize a new clean tank must be paid for by the Contractor.

C. Tanks shall be of a design that can be easily installed. The tank shall be equipped with tie-down lugs or other devices which will hold the tank in place.

D. Tanks shall be constructed of a material that is chemically compatible with the material to be contained and shall be resistant to ultraviolet degradation. Double walled storage tanks shall be sized with the containment tank providing 110 percent capacity of the primary tank. The containment tank shall be sealed to the outer wall of the primary tank to prevent contamination.

E. Tanks shall be closed-top or equipped with removable covers. Tanks shall be filled and drained with through-the-wall or drain ports. Each tank shall be fitted with ports for draining the tank.

F. Exterior and interior walls of tanks shall be properly coated in accordance with manufacturer's specifications.

G. Tank walls shall be adequately supported and protected to prevent collapse, rupture or puncture under normal conditions.

H. Tanks shall be equipped with control devices to prevent overfilling. Each tank shall have a dedicated fill line.

I. Tanks shall have suitably sized nozzles/fittings as standard equipment, at various locations, such as fill, tank vent and pump suction, depending on tank size. All nozzles attached to the tanks below the full level of the tanks shall be two-flanged style. Gaskets shall be of Viton, cross-linked polyethylene, or other material recommended by the manufacturer. Bolts shall clamp the two flanges together, clamping the gaskets to the tank wall.

J. Tanks for chemical mixing or storing shall be lined with corrosion-resistant material and shall be capable of handling cleaning agents at temperatures of at least 90 ºC (200 ºF).

K. Tank vents shall comply with health and safety requirements for normal venting of atmospheric tanks. Vent devices shall be designed in accordance with industry standards to provide adequate relief in the event of deflagration of the tank contents. Proper caution or warning signs as prescribed by health and safety requirements shall be affixed to the tank, in accordance with the approved Health and Safety Plan and Section 01 35 29.

2.07 FLOW MEASUREMENT SYSTEM

A. The Contractor shall provide a non-mechanical (e.g., electromagnetic, ultrasonic) flow measurement system to measure influent flow in accordance with the manufacturer's written instructions and industry standards. The Contractor shall furnish manufacturer's product data, test reports, and material certifications.

B. The flow measurement system shall be capable of operating continuously in outdoor conditions between the ambient temperatures of -10º to 50º C (14 ºF to 122 ºF) and between 0 to 95% relative humidity. The flow measurement system shall be capable of handling suspended solids in the liquid without affecting the accuracy of the system. The flow measurement system shall be constructed of corrosion resistant materials.

C. The flow measurement system shall display instantaneous flow rate, and the register must remain legible over the life of the meter. The system shall include a flow totalizer and a data logger that records instantaneous flow at a maximum interval of 5 minutes.

D. The flow measurement system shall operate at all times that liquid is being pumped.

E. The flow measurement system shall have a +/- 2% accuracy over the complete operating range as supplied. The flow measurement system as installed shall be capable of measuring flows over the full operating range of the influent pumping system to an accuracy of +/- 5%.

F. The flow measurement system shall have a factory wet calibration certificate stating the calibration date, time, and accuracy of the meter. A calibration certificate stating the meter's serial number, person or facility conducting the test, and the date, time, and location of the test shall be provided upon request.

2.08 FLOW EQUALIZATION TANK AND OIL/WATER SEPARATOR

A. The Contractor shall provide flow equalization tanks as follows:

1. Tanks shall be sized to hold a full day's volume of dredge water;

2. Tanks shall have means to remove settable solids and sludge during operation;

3. Tank inlets and outlets for all basin compartments shall be suitably equipped with accessible external valves, stop plates, weirs, or other devices to permit flow control and the removal of an individual unit from service. Tanks shall also be equipped with means to measure and indicate liquid levels and flow rates;

4. Any electrical work in equalization tanks shall meet the appropriate National Electric Code (NEC) requirements; and

5. Suitable access shall be provided to facilitate cleaning and the maintenance of the equipment.

B. The oil/water separator shall be designed for gravity separation of sand, grit, settable solids, semisolids, and free oils (hydrocarbons and other petroleum products) from wastewater associated with dredging operations.

The oil/water separator shall be a pre-packaged, pre-engineered unit designed as follows:

1. Inlet and outlet shall have suitably sized National Pipe Thread (NPT) or flanged connections;

2. A non-clogging stationary under-flow diffusion baffle shall be located in the inlet chamber with discharge located below the normal liquid level. Under-flow diffusion baffle shall be angled and designed to:

a. Reduce horizontal velocity and flow turbulence;

b. Distribute the flow equally over the separator cross sectional area;

c. Direct the flow in a serpentine path so as to enhance hydraulic characteristics and fully utilize all interceptor volume;

d. Completely isolate all inlet turbulence from the oil separation/storage compartment to prevent re-suspension of separated oil; and

e. Promote the separation of settleable solids from wastewater.

3. Vent and waste oil draw-off shall have suitably sized NPT or flanged fittings;

4. The sludge baffle shall retain settleable solids and sediment and prevent them from entering the separation chamber; and

5. A separation/storage chamber shall disperse flow and collect oily solids and sediments.

2.09 POLYMER FEED AND PH ADJUSTMENT SYSTEMS

A. The Contractor shall provide a polymer feed system. The components and appurtenances shall include, but not be limited to:

1. Feeder. The feeder materials shall be compatible with the chemicals. The feeder type shall consist of metering pumps, a magnetic flow meter, or a rotameter. The feeder shall be provided to cover the range for dosage setting and flow pacing. Automatic or manual control shall be provided for dosage setting and flow pacing. Feeder accuracy shall be ±1.0%.

2. Storage. Storage shall be made of noncorrosive material; a steel tank may be used if it has a protective lining. The capacity shall be 15 days of storage, based on the maximum dosage and average daily flow rate. A content indicator shall be provided for each tank.

3. Feed line. Feed line shall be made of noncorrosive materials such as PVC or type 316 stainless steel, and conform to applicable industry standards. A removable top channel with gravity flow is often used for lime slurry in dry feed system.

4. Diffuser. The Contractor shall select the proper type of diffuser depending on the type of chemical used. Types A (in-line) and B diffusers (in a tank inlet or in a channel) that are perforated-pipe diffusers are appropriate for non-scale-forming chemicals or polymer addition, and they shall be used if mixing is achieved solely by diffusion and not by means of positive flash mixing. Types A and B diffusers shall be avoided if the chemical has scale-forming characteristics and types C (in-line removable), D (in a tank inlet or in a structure), and E (gravity feed from a trough above water surface) diffusers shall be considered.

B. The Contractor shall select polymers/chemicals that are EPA-approved for drinking water use and approved for use in the State of New York. The maximum dosages shall conform with the aquatic criteria set by regulatory authorities.

C. The Contractor shall provide emergency spill kits around the polymer feed system to contain and dispose of the spilled material in accordance with requirements in this Section and Sections 01 57 19 and 02 51 19.

D. In chemical storage areas, the Contractor shall provide: clear warning signs on chemical storage areas, eyewashes and safety showers, berms for secondary containments, and adequate lighting and ventilations. All chemical storage tanks shall have tags labeling their contents, access ports, a fill line, drains, overflows, discharge valves, vents, and content indicators (such as a load cell or a differential pressure cell, or sonic-level indicators).

E. The Contractor shall use mixing devices with relatively low speeds, such as mechanical mixers at 400 revolutions per minute (rpm) or less, in order to reduce the potential for breaking the polymer chains.

2.10 LAMELLA CLARIFIER

A. The clarifier units shall be designed as pre-fabricated commercial complete package units to integrate settling and flocculation. The inclined plates shall be National Sanitation Foundation (NSF)-approved and installed in tanks with either a hopper or a sludge thickening bottom.

B. The rapid mixing tanks shall have appropriate design retention time. Design settling velocity shall not exceed 500 gallons per day per square foot. Design parameters must meet laminar flow conditions (Reynolds number shall not exceed 200).

C. The Contractor shall install inclined plate angles and plate spacing conforming to manufacturer's specifications.

D. The clarifiers shall be equipped with a control panel to start and stop operation, or complete system control panel with various stages of control (e.g. manual to fully automatic).

E. The clarifiers shall have suitably sized inlet and outlet connections for transferring influent, sludge, and effluent.

F. Appurtenances shall include:

1. Convenient access (catwalks, ladders, and stairs) for inspection and maintenance;

2. Sludge scraper and underdrain for sludge discharge; and

3. Sampling points for influent and effluent.

2.11 SAND FILTER

A. The Contractor shall provide sand filter media and conform to manufacturer's specifications and NSF requirements set forth for the media's uniformity coefficient, bulk density, specific gravity, effective size, and depth.

B. The following appurtenances shall be provided:

1. Washwater troughs, surface wash or air scouring equipment;

2. Suitably sized inlet and outlet connections;

3. Valves which can be backwashed individually and which have means of positive control of the backwash rate;

4. Flow and head loss measuring devices;

5. Positive means of shutting off flow to a filter being backwashed;

6. Filter influent and effluent sampling points; and

7. Drain ports which allow for uniform distribution of backwash water.

2.12 GRANULAR ACTIVATED CARBON FILTER

A. The granular activated carbon (GAC) tank shall be a circular configuration or unless otherwise approved by the Owner's Representative.

B. The Contractor shall provide GAC media, either virgin or reactivated, which conforms to manufacturer's specifications and NSF requirements set forth for the media's uniformity coefficient, bulk density, specific gravity, effective size, and depth.

C. Each vessel shall have convenient access to all components and the media surface for inspection and maintenance.

D. The following appurtenances shall be provided:

1. Wash water troughs, surface wash or air scouring equipment;

2. Suitably sized inlet and outlet connections;

3. Valves which can be backwashed individually and which have means of positive control of the backwash rate;

4. Flow and head loss measuring devices;

5. Positive means of shutting off flow to a filter being backwashed;

6. Filter influent and effluent sampling points; and

7. Drain ports which allow for uniform distribution of backwash water.

2.13 BACKWASH WATER/EFFLUENT STORAGE TANK

A. The Contractor shall provide a backwash water/effluent holding tank at the end of the DWTS.

B. The tank shall have the same size and working capacity as the Equalization Tank to hold a total day's dredging flow.

PART 3 EXECUTION

3.01 DREDGE WATER TREATMENT SYSTEM

A. The DWTS shall be designed to treat dredging-related wastewater to reduce pollutants to levels that comply with applicable federal, state, and local regulations. The system shall be designed to treat wastewater in a timely manner so as to not adversely impact dredging production.

B. The DWTS shall include sufficient equalization storage capacity for a full day of dredging. The Contractor shall size the DWTS to match the planned dredge production rate and predicted capture of all sources of dredge water, but the design flow rate shall not be less than 120 gallons per minute (gpm). Sources of dredge water include, but are not limited to:

1. Free water captured in bucket during dredging;

2. Porewater from sediment dewatering activities;

3. Water from debris washing and equipment decontamination;

4. Asphalt pad underdrain water; and

5. Stormwater that comes into contact with contaminated sediment on the barge/scow and on the upland Staging Site.

C. The GAC filters shall be designed to facilitate sufficient advance notice of the need for treatment media replacement to prevent discharge of effluent in violation of applicable discharge criteria.

D. The system shall be designed with sufficient redundancy to accommodate system maintenance and unanticipated failure of a single component. Two treatment trains will be operated in parallel with each train sized to treat 50% or more of the maximum daily flow to allow the DWTS to operate continuously between dredging shifts if one train is out of service.

E. The Contractor shall install the DWTS prior to initiating dredging activities. Installation and operation shall be subject to approval by the Owner's Representative before dredging activities may commence.

F. The Contractor shall control noise and odors in accordance with Section 01 57 19. Generators or similar off-grid sources shall comply with requirements set forth in RCNY Title 15, Chapter 28: "Citywide Construction Noise Mitigation," New York Administrative Code Title 24, Chapter 1: "Environmental Protection and Utilities – Air Pollution Control," and Section 01 57 19.

G. The Contractor shall provide electrical service in accordance with the electrical requirements of Section 01 51 00, NEC, and local ordinances.

H. The Contractor shall transport reagents and wastes in accordance with Section 02 51 19.

3.02 WATER QUALITY COMPLIANCE

A. Continuous Monitoring

1. Treated water shall be direct discharged to one of the two Treated Water and Stormwater Discharge Locations.

2. Treated water shall be continuously monitored by the Contractor for turbidity, flow, pH, and conductivity.

3. In the event the measured turbidity exceeds the limit in Table 44 08 40-1, the Contractor shall notify the Owner's Representative, identify the cause of exceedance, and implement corrective measures. If the corrective measures are unsuccessful in producing effluent that meets turbidity limits, the effluent water shall be stored in the effluent storage tanks until further corrective measures are taken that succeed in producing effluent that meets turbidity limits. If necessary, the Contractor shall halt dredging operations that generate additional influent water at no additional cost to the Owner until effluent turbidity limits are met. The Owner's Representative will be notified prior to recommencement of direct discharge.

B. Weekly Monitoring

1. The treated effluent shall be sampled by the Owner's Representative immediately after start up, and weekly thereafter. The samples will be analyzed by Owner's Representative for total suspended solids, oil and grease, PCBs, total PAH, total copper, and total lead to confirm compliance with the water quality criteria limits described in Table 44 08 40-1 prior to discharge. The normal laboratory turnaround time is two weeks, whereas an expedited turnaround time could be requested at 24-hour for most of the parameters except for total PAH.

2. If the weekly monitoring samples exceed the trigger level concentrations for parameters listed in Table 44 08 40, the Owner's Representative shall collect new effluent samples and request expedited turnaround from the analytical lab for those parameters exceeding trigger levels only. In the meantime, effluent water shall be stored in effluent storage tanks and no discharge shall be allowed until the corrective measures are taken and verification of adequate plant performance are received from the analytical lab. The stored water shall be re-treated as needed to meet discharge criteria. If necessary, the Contractor shall halt dredging operations that generate additional influent water at no additional cost to the Owner until effluent limits are met. The Owner's Representative will be notified prior to recommencement of direct discharge.

3.03 STORMWATER TREATMENT

A. Stormwater which falls on the existing asphalt pad may be stored on pad until it can be managed in accordance with Section 02 51 19. The asphalt pad was designed to contain the 100-year, 24-hour storm event without the storage of materials on the pad.

B. Any spills within the treatment plant secondary containment shall be controlled in accordance with the Spill Prevention, Control, and Countermeasure (SPCC) Plan. All stormwater coming in contact with spills or sediment shall be treated. Stormwater that has not been in contact with spills can either be released or treated.

3.04 SYSTEM COMPONENTS

A. Process Instrumentation and Control System

1. Preparation. The Contractor shall inspect all parts and appurtenances for defects prior to installation.

2. Installation. The Contractor shall install and calibrate the process instrumentation and control system per manufacturer's specifications.

3. Testing. Production performance testing shall be conducted by the Contractor.

B. Secondary Containment

1. Preparation. The Contractor shall inspect all parts and appurtenances for defects prior to installation.

2. Installation. The Contractor shall install secondary containment in accordance with manufacturer's recommendations.

C. Pumps

1. Preparation. The Contractor shall inspect pumps for defects prior to installation.

2. Installation. The Contractor shall install pumps in accordance with the manufacturer's installation instructions and recommendations. After installation and connection work is completed, the Contractor shall check the installation for correctness, verifying that connections are free of leaks and the system is operational. Installation personnel shall correct discrepancies. Prior to operating pumps, the Contractor shall furnish and install necessary lubricants for proper operation.

D. Piping

1. Preparation. The Contractor shall inspect piping for defects prior to installation.

2. Installation. The Contractor shall install piping system to match pumps and in accordance with manufacturer's specifications.

3. Testing. The Contractor shall leak test piping with potable water prior to beginning of operation. The Contractor shall correct any leaks disclosed by this test in accordance with the manufacturer's recommendations.

E. Valves

1. Preparation. The Contractor shall inspect all valves for defects prior to installation.

2. Installation. The Contractor shall install valves per manufacturer's specifications. The Contractor shall install suitable shutoff and/or check valves at the suction and discharge lines of each pump. All shutoff and check valves shall be operable from floor level and accessible for maintenance.

3. Testing. The Contractor shall leak test valves with potable water prior to beginning of operation. The system controls valve shall be tested to control all functions of the filter's back flushing, rinsing, and service cycles. The Contractor shall correct any leaks disclosed by this test in accordance with the manufacturer's recommendations.

F. Tanks

1. The Contractor shall install and secure tanks in accordance with manufacturer's specifications. Care shall be exercised in handling and bolting of the tank plates, supports, and members to avoid abrasion or scratching of the coating. Touch-up coating shall be done in accordance with the manufacturer's recommendations as required and if directed by the Owner's Representative.

2. Following completion of installation and cleaning of the tanks, the tanks shall be tested for liquid tightness by filling the tank to its overflow elevation. The Contractor shall correct any leaks disclosed by this test in accordance with the manufacturer's recommendations.

3. The Contractor shall use clean potable water at the time of installation for hydrostatically testing the tanks. The wash wastewater shall be captured and stored in backwash water/effluent storage tank during process startup.

4. Filling and emptying the tanks shall be the responsibility of the Contractor.

5. The backwash water/effluent storage tank:

   a. Shall be large enough to accommodate the water volume of two to three backwashes, depending on the anticipated frequency of filter washing.

   b. Shall be used to capture and test treated water to prove proper operation during process startup before discharge.

   c. Shall serve as a backwash water storage tank during routine operation.

G. Flow Measurement Systems

1. All components shall be inspected for defects prior to installation.

2. The Contractor shall mount instruments so that local indicators and readouts are readily observable from the ground. Mount instrumentation as high as possible in vault areas to avoid potential water damage per manufacturer's specifications.

3. The Contractor shall install the flow element in the DWTS influent line in the correct direction and orientation of flow as recommended by the manufacturer. Unless otherwise specified by the manufacturer, the flow measurement system shall be installed with a minimum length of ten diameters of straight unobstructed rigid pipe on the intake side of the meter and a minimum of five diameters of straight unobstructed rigid pipe on the discharge side of the meter.

4. The flow measurement system shall be installed so the pipe is full of water at all flow rates on both the intake and discharge sides of the meter. The Contractor shall inspect each unit periodically as part of a scheduled maintenance program, as indicated in manufacturer's instructions.

5. The meter shall be installed in the correct direction to flow. The Contractor shall install tamper seals in the presence of the Owner's Representative and secure electronic settings that may alter the accuracy and integrity of the meter and associated devices.

6. The Contractor shall calibrate unit for ranges as indicated in manufacturer's specifications. The Contractor shall record initial flow meter reading at time of installation. The Contractor shall record all measurement and configuration data, and complete appropriate documentation within one month of the completion of the flow-meter installation.

H. Flow Equalization Tank and Oil/Water Separator

1. Preparation. The Contractor shall inspect all parts and appurtenances for defects prior to installation.

2. Installation. The Contractor shall perform installation in accordance with manufacturer's specifications.

3. Testing. Testing shall be performed per manufacturer's specifications.

I. Polymer Feed and pH Adjustment Systems

1. Preparation. The Contractor shall inspect all parts and appurtenances for defects prior to installation.

2. Installation. The Contractor shall perform installation in accordance manufacturer's specifications.

3. Testing. Testing shall be performed per manufacturer's specifications. The Contractor shall perform bench-scale test to optimize polymer/chemical dosage and adjust mixing conditions in accordance with this section.

J. Lamella Clarifier

1. Preparation. The Contractor shall inspect all parts and appurtenances for defects prior to installation.

2. Installation. The Contractor shall perform installation in accordance with manufacturer's specifications.

3. Testing. Testing shall be performed per manufacturer's specifications.

K. Sand Filter

1. Preparation. The Contractor shall inspect equipment and appurtenances for defects prior to installation.

2. Installation. The Contractor shall perform installation in accordance with manufacturer's specifications.

3. Testing. Testing shall be performed per manufacturer's specifications.

L. Granular Activated Carbon Filter

1. Preparation. The Contractor shall inspect GAC vessels and appurtenances for defects prior to installation. The Contractor shall soak GAC media in potable water for maturation prior to installation.

2. Installation. The Contractor shall perform installation in accordance with manufacturer's specifications.

3. Testing. Testing shall be performed per manufacturer's specifications.

M. Backwash/Effluent Storage Tank

1. Preparation. The Contractor shall inspect all parts and appurtenances for defects prior to installation.

2. Installation. The Contractor shall perform installation in accordance with manufacturer's specifications.

3. Testing. Testing shall be performed per manufacturer's specifications.

N. Winterizing

1. If ambient temperatures are expected to fall below freezing during the duration of Work, tanks, pumps and associated pipes and valves shall be winterized to prevent leaking and to maintain DWTS operation.

O. Chemical Storage and Handling Areas

1. All chemical storage and handling areas shall conform to the local safety codes and requirements in Section 01 35 29.

P. Labelling

1. All piping, tanks, equipment shall be labelled with component name, number, treatment train number, flow direction, and fluid/chemical in pipe or component (i.e., NAPL, backwash, polymer, etc.).

3.05 INSTALLATION AND INITIAL TESTING

A. The Contractor shall perform initial testing for the completed DWTS and component units per manufacturer's specifications to confirm that the system meets the design standards. These performance tests shall be conducted at design load conditions wherever practical.

B. The Contractor shall perform initial testing of the entire assembled DWTS with clean water and test the water to make sure the treatment system does not have remnant contamination from other sites. The clean water testing shall be subject to approval of the Owner's Representative prior to treating and discharging any fluids from the DWTS.

C. The Contractor shall perform bench-scale jar testing of polymer/chemical prior to water treatment system startup per manufacturer's recommendations to optimize polymer/chemical dosage and adjust mixing conditions for flocculation application.

D. Process instrumentation and control devices, such as flow meters, polymer/chemical dose control devices, pH meter, turbidity meter, and conductivity meter shall be calibrated prior to DWTS 7. The Contractor shall be prepared to debug items during DWTS startup. The Contractor shall execute the following items during startup including, but not limited to: maturation of granular medium filters, optimization of filter wash conditions, ensuring the proper pump operation sequence, and analysis and control of the treated water quality prior to discharge.

3.06 OPERATION AND MAINTENANCE

A. The Contractor shall monitor the dredge water treatment effluent continuously for the following parameters: pH, conductivity and turbidity. Monitoring equipment shall be maintained and calibrated in accordance with the manufacturer's recommended procedures. Effluent discharge monitoring tests will be performed by others.

B. The Contractor shall conduct weekly inspections of the pumps, piping and tanks. Inspections shall determine if there is evidence of deterioration, or evidence of leaks. An inspection report shall be written to describe the results of each inspection and submitted to the Owner's Representative.

C. The Contractor shall manage and/or dispose of DWTS-generated waste, including sludge, solids, oil and grease, and spent filter media, according to Section 02 51 19.

D. The Contractor shall periodically monitor back pressure of sand filters and backwash filters as needed with treated effluent from the backwash/effluent storage tank.

E. The Contractor shall routinely monitor effluent from the lead activated carbon unit for breakthrough of organics. Activated carbon media shall be replaced as directed by the manufacturer's specifications.

F. The Contractor shall notify the Owner's Representative immediately and record in field reports when the water treatment system is taken offline and again when the system is operational.

G. The Contractor shall maintain good housekeeping and neat conditions in the area of the DTWS. Clean up of soils and or water contaminated due to malfunction of the wastewater treatment system shall be the responsibility of the Contractor.

Table 44 08 40-1 –Draft Treatment System Effluent Discharge Criteria

Continuous Monitoring	
Analyte	**Maximum Concentration**
Turbidity	30 NTU
Daily Flow, MGD	Monitor
pH	Monitor
Conductivity	Monitor
Weekly Monitoring	
Analyte	**Trigger Level Concentration**
Total Suspended Solids	50 mg/L
Oil and Grease	15 mg/L
PCBs per Aroclor	200 ng/L
Total PAH	100 µg/L
Copper, total	61 µg/L
Lead, total	204 µg/L
COD – Lead GAC tank	Monitor
COD – Lag GAC tank	Monitor

Abbreviations:
mg/L = milligram per liter
ng/L = nanogram per liter
µg/L = microgram per liter

[END OF SECTION]